IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Serial No.	10/576,387
Confirmation No.	2362
Filing Date	April 19, 2006
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Group Art Unit	1795
Examiner	Rodee, Christopher D
Patent Docket No.	200309501-3
Title:	Liquid Developer Manufacture Process

BRIEF OF APPELLANT

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Appellant appeals from the March 13, 2009 Office Action (hereinafter "Office Action") finally rejecting claims 1-4, 6-19, and 21-27. A fee transmittal is included in the amount of $540.00 in payment of the fees required under 37 C.F.R. § 41.20(b)(2).

TABLE OF CONTENTS

I. REAL PARTY IN INTEREST 3
II. RELATED APPEALS AND INTERFERENCES 3
III. STATUS OF CLAIMS 3
IV. STATUS OF AMENDMENTS 3
V. SUMMARY OF THE CLAIMED SUBJECT MATTER 3
VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL. 7
VII. ARGUMENT 7
A. Rejection of claims 1, 4, 6-15, 19, and 21-27 under 35 U.S.C. § 103(a). 7
1. No suggestion of dissolving a solid charge adjuvant in a carrier liquid before mixing with resin and grinding to form toner particles. 8
2. No reasonable expectation of success in modifying GB '753. 10
3. No suggestion of dissolving solid charge adjuvant aided by heating the carrier liquid before mixing with resin. 12
4. Unexpected results 13
B. Rejection of claim 2 under 35 U.S.C. § 103(a). 15
C. Rejection of claim 3 under 35 U.S.C. § 103(a). 15
D. Rejection of claims 16-18 under 35 U.S.C. § 103(a). 16
VIII. CLAIMS APPENDIX. 18
IX. EVIDENCE APPENDIX. 22
X. RELATED PROCEEDINGS APPENDIX. 23

I. REAL PARTY IN INTEREST

The real party in interest of the application is to be determined.

II. RELATED APPEALS AND INTERFERENCES

Appellant, Appellant's undersigned legal representative, and the assignee of the pending application are not aware of any appeals, interferences, or judicial proceedings which may be related to, directly affect, or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1-4, 6-19, and 21-27 are pending in the application with claims 5 and 20 previously cancelled. All pending claims stand finally rejected and are being appealed.

IV. STATUS OF AMENDMENTS

Appellant did not file any amendment subsequent to final rejection.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

A concise explanation of the subject matter defined in each of the independent and dependent claims involved in the appeal follows with reference to the original specification.

Claim 1 sets forth a method of creating a liquid developer with improved conductivity including dissolving a solid charge adjuvant in a carrier liquid aided by heating the carrier liquid, then mixing the dissolved charge adjuvant with a thermoplastic resin and carrier liquid, grinding the mixture to form toner particles, and adding a charge director to charge the toner particles. (P. 3, ll. 26-31.)

Claim 2 depends from claim 1 and sets forth that the mixing and grinding include mixing the thermoplastic resin with carrier liquid, heating the mixture of carrier liquid and thermoplastic resin to plasticize the resin, cooling the plasticized resin, adding the dissolved charge adjuvant to the cooled plasticized resin, and grinding the mixture of charge adjuvant and plasticized resin to form toner particles. (P. 3, l. 32 to p. 4, l. 3.)

Claim 3 depends from claim 1 and sets forth that the mixing and grinding includes mixing the thermoplastic resin with carrier liquid and dissolved charge adjuvant at an elevated temperature, cooling the mixture, and grinding the cooled mixture to form toner particles. (P. 4, ll. 4-8.)

Claim 4 depends form claim 1 and sets forth adding a colorant. (P. 4, l. 9).

Claim 6 depends from claim 1 and sets forth that the charge adjuvant is a metallic soap. (P. 4, l. 10.)

Claim 7 depends from claim 6 and sets forth that the metallic soap is an aluminum soap. (P. 4, ll. 10-11.)

Claim 8 depends from claim 6 and sets forth that the metallic soap includes an aluminum stearate. (P. 4, l. 11.)

Claim 9 depends from claim 7 and sets forth that the aluminum stearate includes aluminum tri-stearate. (P. 4, l. 12.)

Claim 10 depends from claim 1 and sets forth that the dissolving is aided by heating to a temperature exceeding 120°C. (P. 4, ll. 13-14.)

Claim 11 depends from claim 1 and sets forth that the dissolving is aided by heating to a temperature exceeding 130°C. (P. 4, ll. 14.)

Claim 12 depends from claim 1 and sets forth that the dissolving is aided by heating to a temperature of no greater than 130°C. (P. 4, ll. 14-15

Claim 13 depends from claim 1 and further includes cooling the dissolved charge adjuvant to a temperature below 60°C, prior to mixing it with the resin. (P. 4, ll. 16-17.)

Claim 14 depends from claim 1 and sets forth that the charge adjuvant has only limited solubility in the carrier liquid at 25°C. (P. 4, ll. 18.)

Claim 15 depends from claim 1 and sets forth that the charge adjuvant is substantially insoluble in the carrier liquid at 25°C. (P. 4, ll. 19.)

Claim 16 depends from claim 1 and sets forth that the charge adjuvant does not dissolve in the carrier liquid at a temperature at which it is mixed with the resin, but remains dissolved therein, when dissolved at a higher temperature. (P. 4, ll. 20-22.)

Claim 17 depends from claim 1 and sets forth that the charge adjuvant does not substantially dissolve in the carrier liquid at 40°, but remains dissolved therein, when dissolved at a higher temperature. (P. 4, ll. 23-24.)

Claim 18 depends from claim 1 and sets forth that the charge adjuvant does not substantially dissolve in the carrier liquid at 60°, but remains dissolved therein, when dissolved at a higher temperature. (P. 4, ll. 23-24.)

Claim 19 depends from claim 1 and sets forth that the dissolving further includes adding a surfactant to the solution of carrier liquid and charge adjuvant. (P. 4, ll. 25-26.)

Claim 21 depends from claim 1 and sets forth that the mixing and grinding are performed in a same grinder or a same attritor. (P. 4, ll. 27-28.)

Claim 22 depends from claim 1 and sets forth that the mixing is performed in a first vessel and the grinding is performed in a second vessel. (P. 4, ll. 29-30.)

Claim 23 depends from claim 22 and sets forth that the mixing is performed in a mixer without grinding media. (P. 4, ll. 30-31.)

Claim 24 depends from claim 21 and sets forth that the grinding is performed in a grinder or an attritor. (P. 4, l. 32.)

Claim 25 depends from claim 2 and sets forth that the dissolving is aided by heating to a temperature exceeding 120°C. (P. 4, l. 13-14.)

Claim 26 depends from claim 3 and sets forth that the dissolving is aided by heating to a temperature exceeding 120°C. (P. 4, l. 13-14.)

Claim 27 depends from claim 10 and further includes cooling the dissolved charge adjuvant to a temperature below 60°C, prior to mixing it with the resin. (P. 4, ll. 16-17.)

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL.

Whether claims 1-4, 6-19, and 21-27 are unpatentable under 35 U.S.C. § 103(a) over GB 1,086,753 (hereinafter, GB '753) in view of Diamond, et al., Handbook of Imaging Materials (hereinafter, Diamond).

VII. ARGUMENT

A. Rejection of claims 1, 4, 6-15, 19, and 21-27 under 35 U.S.C. § 103(a).

At least four independent reasons exist supporting patentability of claim 1, as discussed below, each of which is alone sufficient to overcome the rejection. Initially, the Office bears the burden of factually supporting any conclusion of obviousness. The Patentee need not submit any evidence of non-obviousness until the Office produces a prima facie case that the claims are obvious. Three basic criteria are required to establish a prima facie case. First, the prior art must suggest to those of ordinary skill in the art, "that they should make the claimed composition or device, or carry out the claimed process." In re Vaeck, 947 F.2d 488, 493, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991). Second, the prior art must reveal "that in so making or carrying out, those of ordinary skill would have a reasonable expectation of success." Id. Third, all of the claimed limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580, 582-3 (CCPA 1974).

1. No suggestion of dissolving a solid charge adjuvant in a carrier liquid before mixing with resin and grinding to form toner particles.

The subject matter of claim 1 is described above. The Office Action finally rejects claim 1, incorporating by reference the prior reasons for rejection made in the September 17, 2009 Office Action, and alleges that GB '753 discloses every limitation except for heating the carrier liquid, using a thermoplastic resin, and adding the charge director. The Office Action relies on inferences and Diamond to remedy the deficiencies. Since the final rejection incorporates by reference the prior reasons for rejection, arguments herein address the Office Action as though it includes such prior reasons.

The Office Action alleges that GB '753 discloses using aluminum tristearate in a method of making liquid toner. The Office Action also alleges that aluminum tristearate is well-known as a charge adjuvant. Because the prior art recognizes aluminum tristearate as a charge adjuvant, the Office Action assumes that GB '753 thus discloses dissolving a charge adjuvant in the method of making liquid toner. Appellant traverses the Office's assumption as being inconsistent with the knowledge of those of ordinary skill, as evidenced by the cited art.

P. 1, ll. 47-52 of GB '753 states that its invention pertains to positively charged particles. Appellant notes that the 5th full paragraph on p. 244 of Diamond lists aluminum tristearate as a charge director (charge control agent), instead of a charge adjuvant, for positive toners. Additionally, p. 1, l. 20 of the original specification incorporates by reference US Patent No. 4,707,429, which lists metallic soaps as charge directors, instead of charge

adjuvants, for positive toners in col. 5, ll. 6-9. Since aluminum tristearate is a metallic soap, it follows that those of ordinary skill would consider it to function as a charge director for the positively charged particles in GB '753.

The Office Action alleges that the amine listed on p. 1, l. 60 of GB '753 could instead be the charge director, but does not present evidence in support of the conclusion. Neither Diamond nor US 4,707,429 include amines in their lists of suitable charge directors for positive toners. While Diamond may be considered to describe generally the use of a charge director, such does not constitute establishing that the amine in GB '753 functions as a charge director. Instead, the prior art supports the conclusion that aluminum tristearate would function as the GB '753 charge director. Indeed, Diamond itself expressly supports such a conclusion.

The Office otherwise fails to provide substantial evidence in support of its allegations. Under the Administrative Procedure Act (APA) applicable to the Office's allegation, the standard of review applied to findings of fact is the "substantial evidence" standard. See, In re Gartside, 203 F.3d 1305, 1315, 53 USPQ2d 1769, 1775 (Fed. Cir. 2000). See also MPEP § 2144.03 (2007). Essentially, the Office's allegations appear to assume it is well-known that aluminum tristearate is a charge adjuvant for positively charged particles and amine is a charge director. Appellant asserts these facts are not well known. It is not permissible for the Office to base rejections on unsupported assumptions.

The functional difference between charge adjuvants and charge directors is significant and is explained at least at p. 5, ll. 15-34 of the original

specification. The Office Action does not establish with substantial evidence that those of ordinary skill would consider the aluminum tristearate in GB '753 to function as a charge adjuvant. Rather, without supportive evidence, the Office Action assumes that aluminum tristearate necessarily functions as a charge adjuvant in GB '753 merely because it is known generally as a charge adjuvant.

It does not necessarily follow that aluminum tristearate functions as a charge adjuvant in GB '753. "The mere fact that a certain thing may result from a given set of circumstances is not sufficient to establish inherency." In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (citations omitted) (emphasis in original); MPEP § 2112. Further, "[i]n relying upon the theory of inherency, the Examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis added); MPEP § 2112.

At least for such reasons, the cited combination cannot be considered to suggest dissolving a solid charge adjuvant in a carrier liquid before mixing with resin and grinding to form toner particles, as set forth in claim 1.

2. No reasonable expectation of success in modifying GB '753.

As explained at p. 5, l. 15-34 of the specification, the charging of toner particles is a complex process. In general, most resins do not charge easily, even when a charge director is used. To aid in charging, a charge adjuvant

may be incorporated in the toner particles. Various theories of charging exist, which may or may not operate individually or in combination given a particular situation. Also, introduction of a charge director in solution may improve reaction of a charge adjuvant with the resin, resulting in better charging by the charge director. Appellant asserts that those of ordinary skill have no reasonable expectation of success in somehow modifying the teachings of GB '753 to make aluminum tristearate function as a charge adjuvant instead of as a charge director. GB '753 fails even to recognize the separate functions of charge adjuvants and charge directors.

Appellant notes that GB '753 is silent regarding the designation of any charge director or charge adjuvant. GB '753 merely lists compounds without describing their function, except that p. 3, ll. 36-38 describes a combination of aluminum salt and Lube Oil 564 (polymeric amine) as a "dispersant mixture." The term "dispersant mixture" does not appear to relate in any way to the function of a charge director or charge adjuvant. Also, GB '753 seems to contemplate on p. 2, ll. 70-75 that the aluminum salt or Lube Oil 564 additive could be used alone though, for some unexplained reason, such would yield lower conductivity.

The technical knowledge displayed in GB '753 is so rudimentary with regard to the function of the additives that GB '753 cannot be considered to produce a reasonable expectation of success in creating a liquid developer with improved conductivity by dissolving a solid charge adjuvant in carrier liquid before mixing with resin and grinding to form toner particles, as set forth in claim 1. Though Diamond describes liquid toner composition,

preparation, properties, charging, etc., Diamond does not remedy the deficiency in GB '753 of failing to contemplate the function of the additives except as a "dispersant mixture." At least for such reasons, claim 1 is patentable.

3. No suggestion of dissolving solid charge adjuvant aided by heating the carrier liquid before mixing with resin.

Claim 1 sets forth heating carrier liquid and dissolving a solid charge adjuvant therein before mixing the dissolved charge adjuvant with resin. The Office Action alleges that GB '753 suggests the dissolving as being aided by heating the carrier liquid on p. 1, ll. 68-74. However, review of the referenced text reveals that its meaning is not appropriately construed. GB '753 states, "both materials (1) and (2) must be present and should be in solution at the temperature used for image development." The term "image development" refers to the process on p. 1, ll. 33-38 when toner particles migrate "to the image surface under influence of the image charge." It follows that the metal salt of an organic acid (1) and the amine (2) "should be in solution," as opposed to being in a precipitate or other solid form during image development.

Appellant asserts that the disclosure in GB '753 regarding materials (1) and (2) being in solution at the temperature of image development does not bear a rational relation to dissolving a solid material by heating a carrier liquid before mixing with a resin. Even though GB '753 describes materials (1) and (2) as being in solution, it does not provide evidence of how they were dissolved. Evidence presented by the Office must be "substantial."

Unrelated or, at best, tangential evidence does not satisfy the requirement of providing substantial evidence.

The Office Action also states it would have been obvious to heat the mixture of aluminum stearate and toner particles in GB '753 because heating a liquid to enhance solubility is ubiquitous and common knowledge in the chemical arts. However, the common knowledge of heating to enhance solubility does not address the deficiencies of the cited combination of references. The Office Action fails to provide substantial evidence even of a suggestion to dissolve a solid charge adjuvant in carrier liquid, especially before mixing with resin. Since it is not known to dissolve solid charge adjuvant in carrier liquid, it cannot be considered as known to use heat to aid the dissolving.

At least for such reasons, the cited combination cannot be considered to suggest the claimed limitation and claim 1 is patentable.

4. Unexpected results.

A conclusion of obviousness first requires determining the scope and content of the prior art, ascertaining differences between the prior art and the claims at issue, and resolving the level of ordinary skill in the pertinent art. Graham v. John Deere, 383 U.S. 1, 17 (1966). Secondary considerations, such as long felt but unsolved needs, failure of others, and unexpected results, might be used to enlighten the inquiry. Id. To the extent that a much greater difference exists between the prior art and the claims than appreciated in the Office Action, the level of ordinary skill may not sufficient to overcome such differences without undue experimentation.

In determining obviousness, the Office "must ask whether the improvement is more than the predictable use of prior art elements according to their established functions." KSR Int'l Co. v. Teleflex Inc., 550 U.S. _, 127 S.Ct. 1727, 1740 (2007). Often, the Office must "look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art." Id. Such evaluations are all involved in determining whether an apparent reason existed to combine the known elements in the manner claimed. Id. at 1741.

Appellant notes that claim 1 expressly requires dissolving a solid charge adjuvant in a carrier liquid aided by heating, then mixing the dissolved charge adjuvant with a thermoplastic resin and carrier liquid, and grinding the mixture to form toner particles. Comparative examples (p. 7, ll. 23-31 of the original specification) that use a charge adjuvant, but do not include first dissolving a solid charge adjuvant in a carrier liquid, fail to produce (p. 8, l. 7-9) the increased conductivity shown in Fig. 5 of the original specification. Also, Fig. 5 shows (p. 8, l. 10-12) that the comparative examples require a longer grinding time for a particular required conductivity.

The Office Action fails to provide evidence that an apparent reason existed to combine the known elements in the manner claimed. The Office Action also fails to provide evidence that those of ordinary skill would expect the described advantageous results by modifying the references of the cited combination to perform the claimed method. Appellant asserts that undue experimentation would be required to overcome the differences between the

claimed method and the cited combination. At least for such reasons, claim 1 is patentable.

B. Rejection of claim 2 under 35 U.S.C. § 103(a).

Claim 2 sets forth that the mixing and grinding includes mixing the thermoplastic resin with carrier liquid, heating the mixture of carrier liquid and thermoplastic resin to plasticize the resin, and cooling the plasticized resin. The dissolved charge adjuvant is added to the cooled plasticized resin and the mixture of charge adjuvant and plasticized resin is ground to form toner particles. Fig. 4 of the present specification and the text associated therewith, including Experiment B, describe one example of a method encompassed by claim 2.

The cited combination does not disclose and the Office Action does not allege that it discloses mixing dissolved charge adjuvant with cooled plasticized resin, as set forth in claim 2. The Office Action merely alleges that a process of heating resin in carrier liquid to mill the resin into fine particles would be obvious. However, such a teaching is not definitive in determining obviousness of the claimed method of mixing dissolved charge adjuvant with cooled plasticized resin. Heating the resin represents only part of the claimed method. Claim 2 is thus further patentable.

C. Rejection of claim 3 under 35 U.S.C. § 103(a).

Claim 3 sets forth mixing the thermoplastic resin with carrier liquid and dissolved charge adjuvant at an elevated temperature, cooling the mixture, and grinding the cooled mixture to form toner particles. The Office Action

alleges it is common knowledge to heat a liquid to enhance solubility of a solid in the liquid. Regardless, the proper initial question is whether it is known even to dissolve a solid charge adjuvant in a carrier liquid for a liquid developer. If it is not known to dissolve the charge adjuvant, then it cannot be known to aid dissolution using heat. Only the Appellant's own specification discloses dissolving a solid charge adjuvant, so it cannot be considered as known to aid such dissolution using heat. At least for such reasons, the cited combination cannot be considered to suggest the claimed limitation.

D. Rejection of claims 16-18 under 35 U.S.C. § 103(a).

Claims 16-18 set forth that the charge adjuvant does not dissolve in the carrier liquid at a certain temperature, but remains dissolved therein, when dissolved at a higher temperature. The cited combination does not suggest and the Office Action does not allege that it suggests the subject matter of claims 16-18. The Office Action merely alleges that heating a solid material to enhance solubility is known. However, such a teaching is not definitive in determining obviousness of the claimed method of using a charge adjuvant that does not dissolve in the carrier liquid at a certain temperature, but remains dissolved therein, when dissolved at a higher temperature. Heating the carrier liquid to enhance solubility represents only part of the claimed method. Further, Appellant establishes above that no suggestion exist in the art to dissolve a solid charge adjuvant aided by heating a carrier liquid before mixing with resin. Such claims are thus patentable.

Appellant herein establishes adequate reasons supporting patentability of claims 1-4, 6-19, and 21-27 and requests allowance of all pending claims.

Respectfully submitted,

Dated: August 5, 2009

By: /James E. Lake/
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VIII. CLAIMS APPENDIX.

1. (original) A method of creating a liquid developer with improved conductivity comprising:

dissolving a solid charge adjuvant in a carrier liquid aided by heating the carrier liquid;

then mixing the dissolved charge adjuvant with a thermoplastic resin and carrier liquid;

grinding the mixture to form toner particles; and

adding a charge director to charge the toner particles.

2. (previously presented) A method according to claim 1 wherein mixing and grinding comprises:

mixing the thermoplastic resin with carrier liquid;

heating the mixture of carrier liquid and thermoplastic resin to plasticize the resin;

cooling the plasticized resin;

adding the dissolved charge adjuvant to the cooled plasticized resin;

grinding the mixture of charge adjuvant and plasticized resin to form toner particles.

3. (previously presented) A method according to claim 1 wherein mixing and grinding comprises:

mixing the thermoplastic resin with carrier liquid and dissolved charge adjuvant at an elevated temperature;

cooling the mixture;

grinding the cooled mixture to form toner particles.

4. (previously presented) A method according to claim 1, comprising adding a colorant.

5. (cancelled)

6. (previously presented) A method according to claim 1, wherein said charge adjuvant is a metallic soap.

7. (original) A method according to claim 6 wherein the metallic soap is an aluminum soap.

8. (original) A method according to claim 6, wherein said metallic soap comprises an aluminum stearate

9. (original) A method according to claim 7 wherein the aluminum stearate comprises aluminum tri-stearate.

10. (previously presented) A method according to claim 1, wherein said dissolving is aided by heating to a temperature exceeding 120°C.

11. (original) A method according to claim 1, wherein said dissolving is aided by heating to a temperature exceeding 130°C.

12. (previously presented) A method according to claim 1, wherein said dissolving is aided by heating to a temperature of no greater than 130°C.

13. (previously presented) A method according to claim 1 further comprising cooling the dissolved charge adjuvant to a temperature below 60°C, prior to mixing it with the resin.

14. (previously presented) A method according to claim 1 wherein the charge adjuvant has only limited solubility in the carrier liquid at 25°C.

15. (previously presented) A method according to claim 1 wherein the charge adjuvant is substantially insoluble in the carrier liquid at 25°C.

16. (previously presented) A method according to claim 1 wherein the charge adjuvant does not dissolve in the carrier liquid at a temperature at which it is mixed with the resin, but remains dissolved therein, when dissolved at a higher temperature.

17. (previously presented) A method according to claim 1 wherein the charge adjuvant does not substantially dissolve in the carrier liquid at 40°, but remains dissolved therein, when dissolved at a higher temperature.

18. (previously presented) A method according to claim 1 wherein the charge adjuvant does not substantially dissolve in the carrier liquid at 60°, but remains dissolved therein, when dissolved at a higher temperature.

19. (previously presented) A method according to claim 1 wherein the dissolving further comprises adding a surfactant to the solution of carrier liquid and charge adjuvant.

20. (cancelled)

21. (previously presented) A method according to claim 1 wherein said mixing and grinding are performed in a same grinder or a same attritor.

22. (previously presented) A method according to claim 1 wherein said mixing is performed in a first vessel and wherein said grinding is performed in a second vessel.

23. (original) A method according to claim 22 wherein said mixing is performed in a mixer without grinding media.

24. (previously presented) A method according to claim 21 wherein said grinding is performed in a grinder or an attritor.

25. (previously presented) A method according to claim 2, wherein said dissolving is aided by heating to a temperature exceeding 120°C.

26. (previously presented) A method according to claim 3, wherein said dissolving is aided by heating to a temperature exceeding 120°C.

27. (previously presented) A method according to claim 10 further comprising cooling the dissolved charge adjuvant to a temperature below 60°C, prior to mixing it with the resin.

IX. EVIDENCE APPENDIX.

Not applicable.

X. RELATED PROCEEDINGS APPENDIX.

Not applicable.